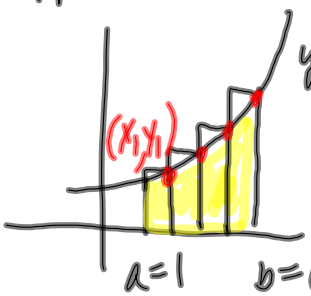
5.1 rectangular approximation methods

approximate area



$y=f(x)=x^2+2$

$n=4$

$\Delta x=\frac{6-1}{4}$

$\Delta x=1.25$

$x_1=1+1.25$ $y_1=2.25^2+2$ $A_1=y_1\cdot\Delta x=8.8281$

$x_2=1+2(1.25)$ $y_2=3.5^2+2$ $A_2=y_2\cdot\Delta x=17.8125$

$x_3=1+3(1.25)$ $y_3=4.75^2+2$ $A_3=y_3\Delta x=30.2031$

$x_4=1+4(1.25)$ $y_4=6^2+2$ $A_4=y_4\Delta x=47.5$

(K)

$RRam(4)=104.84375$

Nov 12-12:45 PM

$$\Delta x=\frac{b-a}{n}$$

$x_1=a+\Delta x$ $y_1=f(a+\Delta x)$ $A_1=f(a+\Delta x)\Delta x$

$x_2=a+2\Delta x$ $y_2=f(a+2\Delta x)$ $A_2=f(a+2\Delta x)\Delta x$

$x_3=a+3\Delta x$ $y_3=f(a+3\Delta x)$ $A_3=f(a+3\Delta x)\Delta x$

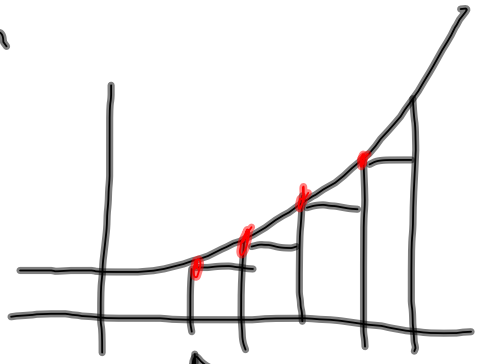
$x_k=a+k\Delta x$ $y_k=f(a+k\Delta x)$ $A_k=f(a+k\Delta x)\Delta x$

$x_n=a+n\Delta x$

$$RRAM=\sum_{k=1}^{n} f(a+k\Delta x)\cdot\Delta x$$

Nov 12-1:25 PM

lram

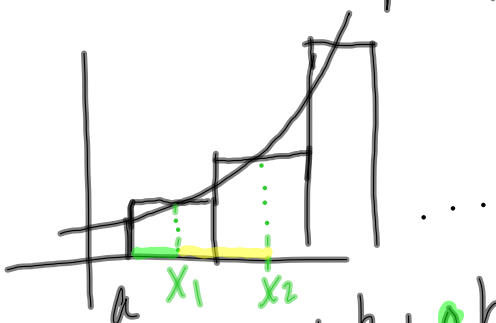


1st x coord is at a

$$\sum_{k=0}^{n-1} f(a + k \cdot \Delta x)\,\Delta x$$

Nov 12-1:45 PM

mram (midpoint)



$x_1 = a + \frac{h}{2} + 0h$

$x_2 = a + \frac{h}{2} + 1h$

$x_3 = a + \frac{h}{2} + 2h$

$x_4 = a + \frac{h}{2} + 3h$

mram

$$\sum_{k=0}^{n-1} f\left(a + \frac{h}{2} + kh\right) \cdot h$$

Nov 12-1:55 PM